



Financial-integration thresholds for consumption risk-sharing



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Samreen Malik*

New York University-Abu Dhabi, PO Box 903, New York, NY 10276, USA

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ABSTRACT

I present empirical evidence of how international consumption risk sharing varies by levels of financial integration. In a panel data set of 64 countries from 1985–2009, I show a significant presence of threshold effects of financial integration on international consumption risk sharing. The results indicate the presence of two significant thresholds and three corresponding regimes. Below the lower threshold is limited but statistically significant consumption risk-sharing. Above the higher threshold is significant risk-sharing. However, intermediate to the two thresholds is a regime with excess volatility. These findings are therefore suggestive of a U-shaped relationship between financial integration and consumption risk-sharing, with a potentially destabilizing intermediate regime.

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1. Introduction

Over the past three decades, a large increase has occurred in the stock of cross-border financial capital holdings, especially in emerging and developing economies. In theory, such financial integration should promote international consumption risk-sharing. Cross-border financial linkages can decouple domestic consumption from country-specific components of output shocks, thereby decreasing the correlation between domestic consumption and output, and increasing the correlation between domestic consumption and world consumption. However, the empirical evidence on the relationship between financial integration and international consumption risk-sharing is mixed. Existing research suggests that risk-sharing has not increased much, especially in emerging economies, despite the wave of financial globalization. In fact, some evidence shows greater financial integration can also increase the correlation between domestic consumption and domestic output, and can even lead to excess volatility (i.e., *reduced* consumption risk-sharing).¹

The puzzling empirical relationship between financial integration and international consumption risk-sharing has led some people to posit the existence of a *threshold effect*, whereby consumption risk-sharing is achieved only after a certain degree of financial integration is reached (see for e.g., Kose, Prasad, & Terrones, 2007, 2009b). In this paper, I formally test for the *existence* of such threshold effects in a panel data set of 64 countries from 1985–2009. In particular, I estimate thresholds by adapting a method for threshold estimation developed by Hansen (1999) for balanced panels. This methodology allows for estimation of thresholds, confidence intervals, and standard errors directly from the data, and thereby eschews an ad-hoc categorization of countries based on GDPper-capita (versus the categorization based on actual measures of financial integration of interest).

* Tel.: +971 50 441 5197.

E-mail address: samreen.malik@nyu.edu.

¹ See, for example, recent work by Kose, Prasad, & Terrones (2003, 2007, 2009b) and Bai & Zhang (2012).

To implement the methodology empirically, I proxy financial integration by various quantity-based financial-integration measures,² and measure consumption risk-sharing in terms of the coefficient on the annual country-specific consumption growth rates against country-specific output growth rates in a panel controlling for individual (and time) fixed effects (Demyanyk, Ostergaard, & Sorensen, 2008; Kose et al., 2007).

I find that economies with highly integrated capital markets have fostered imperfect but better risk-sharing than countries with less integrated capital markets. More formally, the results show that financial integration when measured using either (1) the sum of gross total foreign direct investment (FDI) and foreign portfolio investment (FPI) (as a ratio of GDP) (henceforth equity volume) or (2) total foreign assets and liabilities (to GDP) (henceforth total volume) reveal two significant thresholds corresponding to three regimes. A lower threshold value of financial integration characterizes the first regime (e.g., the estimated threshold level in the case of equity volume to GDP as the financial integration measure is approximately 43.5%). Country-year pairs falling in this regime show statistically significant and positive but economically small international consumption risk-sharing. In the third regime (e.g., the estimated level of threshold for equity volume to GDP is approximately 84.1%), country-year pairs' risk-sharing remains imperfect but is both statistically and economically significant, with an average consumption risk-sharing coefficient of 50% (coefficient of 0 corresponds to perfect consumption risk-sharing, whereas a coefficient of 1 indicates no consumption risk-sharing). However, intermediate to the two thresholds is a regime with excess volatility (relative to Regime 1 and Regime 3), where average correlation between country-specific consumption growth rates and output growth rates exceed country-specific consumption and output growth rates in Regime 1 and Regime 3. These findings therefore suggest a U-shaped relationship between financial integration and consumption risk-sharing, with a potentially destabilizing intermediate regime that prior literature has missed.

Consumption risk-sharing estimated in Regime 1 and Regime 3 is in line with the theoretical predictions that better financial integration fosters better consumption risk-sharing. However, these predictions are at odds with Regime 2, which has better financial integration but worse consumption risk-sharing relative to Regime 1. Further investigation into the composition of capital stock across these regimes reveals that the key difference between these three regimes is the quantity of FDI liabilities (as a percentage of total assets and liabilities). In particular, on average Regime 2 have the highest FDI liabilities. This regime can be reconciled with the recent theoretical predictions that initial capital in the form of FDI liabilities can in fact reduce consumption risk-sharing (see e.g., Acemoglu & Zilibotti, 1997; Milesi-Ferretti & Razin, 1998; Razin & Sadka, 2001).

The contributions of this paper are twofold: First, the finding of significant threshold effects suggests a nuanced approach to interpreting the empirical relationship between financial integration and consumption risk-sharing more generally than has been done in the existing literature. In the existing literature, patterns of consumption risk-sharing are generally studied using simple, linear interaction of idiosyncratic components of output with measures of financial integration, or using separate estimates for sub-samples of developing, emerging, or industrial economies (see e.g., Kose et al., 2007, 2009b). Threshold effects, however, indicate the presence of statistically significant non-linearity in the relationship between financial integration and risk-sharing. Such non-linearities are consistent with the mixed findings in the existing literature, but suggest an alternative rationale whereby economies face an intermediate hurdle on the path of financial integration before benefits of consumption risk-sharing are realized. Second, unlike existing literature (Kose et al., 2007, 2009b), this paper highlights that in addition to debt liabilities, primitive capital in the form of FDI liabilities may also be an additional source of worsening consumption risk-sharing, which is captured through the intermediate regime.

The remainder of the paper is structured as follows. Section 2 discusses related literature. Section 3 outlines the data set, and Section 4 provides details on the empirical methodology. Section 5 presents the results. Section 7 concludes. Appendix A and B contain supporting tables and illustrations, respectively.³

2. Related literature

A large literature exists on consumption risk-sharing in industrialized economies. The consensus from this literature is that risk-sharing in industrialized economies is imperfect (Ambler, Cardia, & Zimmermann, 2004; Backus, Kehoe, & Kydland, 1992; Canova & Ravn, 1996; Pakko, 1998) but has improved significantly with greater integration of financial markets (Demyanyk et al., 2008; Lewis, 1996; Obstfeld, 1994; Pakko, 1998). Ambler et al. (2004), Backus et al. (1992), and Canova & Ravn (1996) all study cross-country consumption correlations in industrialized countries and conclude that risk-sharing remains low relative to the predictions of a standard Arrow–Debreu contingent claims economy.

More recently, researchers have focused on consumption risk-sharing in emerging economies. Kose et al. (2003, 2007, 2009b) and Bai & Zhang (2012) show that, relative to industrialized countries, consumption risk-sharing in emerging economies is (1) small and (2) appears much less responsive to an increase in financial market integration. Kose et al. (2003, 2007) employ a variety of measures of consumption risk-sharing for 72 economies for the sample period 1960–2004. They divide the full sample of these countries into three sub-groups: advanced countries (21), emerging markets (22), and other developing countries (33). They conclude that advanced economies have achieved more consumption risk-sharing during the sample period. Similarly, Bai & Zhang (2012) find that

² Two types of measures of financial integration exist. The first type are de-jure measures that attempt to capture legal restrictions on cross-border capital flows (see Chinn & Ito, 2008; Edison, Klein, Ricci, & Slok, 2002; Edwards, 2001; Quinn, 1997). The second type is de-facto measures that are based on actual cross-border capital stocks, and include the positive sum of items in the capital account viewed relative to GDP. Quantity based measures provide a less volatile and a more appropriate measure of integration for studying risk-sharing phenomenon (see, e.g., Kose, Prasad, Rogoff, & Wei (2009a) for a discussion of the favorability of such measures in the context of consumption risk-sharing).

³ I also provide an additional section in the appendix, where I compare the results of the current paper and the existing literature to highlight that the true process of financial integration is not fully captured in the existing literature because of a priori assumption about the existence and level of threshold.

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